

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Vehicle Tyres

We, CONTINENTAL GUMMI-WERKE A.—G., of Postschliessfach, Hannover, Germany, a German Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

Pneumatic tyres are known in which the carcass of the tyre generally comprises two different reinforcing insertions, e.g. twisted steel wires and cord threads of textile material, such as cotton cord threads.

It has already been proposed, corresponding to the preparation of tyres with reinforcing insertions exclusively of textile materials, to employ insertions of different materials in a crossed arrangement, i.e. in each of the two directions of crossed threads steel and textile thread layers, which are anchored to bead rings, have been provided.

The invention likewise relates to pneumatic tyres, with reinforcing insertions of different extensibilities which are anchored to the bead portions of the tyre by means of bead rings.

In accordance with the invention, a pneumatic vehicle tyre is provided having reinforcing insertions of different extensibilities which are anchored to the bead portions of the tyre by means of bead rings, wherein reinforcing insertions with the smaller extensibility are incorporated in the tyre only in one direction inclined obliquely to the mid-circumferential line of the tyre and reinforcing insertions of greater extensibility are incorporated in the tyre in another direction inclined obliquely to the mid-circumferential line of the tyre and crossing the first-mentioned reinforcing insertions.

Preferably, a layer of reinforcing insertions of smaller extensibility and two or more layers of reinforcing insertions of greater extensibility crossing the former are provided, a layer of obliquely inclined reinforcing insertions of smaller extensibility most suitably being located between several layers of reinforcing insertions of greater extensibility.

By using cord layers of small extensibility [Price 3s. 0d.]

but with high strength, such as steel wire insertions, the number of insertions may be decreased, so that a thin tyre wall is produced with consequent reduction of internal friction and hence of heat generation. A satisfactory absorption of the stresses is given by the highly rigid cord layers. On the other hand, the cord layers consisting, for example, of textile materials and having a higher extensibility ensure that the stresses in the circumferential direction of the tyre, namely, driving and braking stresses, and the lateral stresses, due to the revolution of the wheel are satisfactorily absorbed. A tyre carcass is thus given which contains a relatively small number of wire or thread layers capable of absorbing all the stresses set up in use and having low heat generation, thus rendering it suitable for high loading stresses.

Embodiments of the present invention are illustrated in the drawings, in which:

Fig. 1 shows a cross-section through a pneumatic tyre;

Fig. 2 shows an enlarged partial cross-section through a bead of the tyre of Fig. 1;

Figs. 3 and 5 show the directions of the reinforcing threads or wires in schematic form; the mid-circumferential line being indicated by chain-dotting;

Figs. 4 and 6 show sectional views of Figs. 3 and 5 respectively, taken on the line IV—IV in Fig. 3 and the line VI—VI in Fig. 5.

Fig. 1 shows a tyre containing near its inner surface two layers of twisted steel wires 1 represented by full lines. Four layers of textile threads 2 represented by dotted lines are located thereover. Fig. 2 shows that the layers consisting of the steel wires 1 and the textile threads 2 are passed round separate bead rings 3 and 4 respectively. The use of separate bead rings is not essential to the invention, however. The insertions of smaller extensibility and the insertions of greater extensibility can be passed round a common bead ring or anchored to it in the tyre foot.

Fig. 3 shows the reinforcing insertions of smaller extensibility, namely the steel wires 1,

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arranged in one obliquely inclined direction, whereas the other insertions, the textile threads 2, with the greater extensibility are arranged in another obliquely inclined position and crossing the steel wires 1. The mid-circumferential line is shown at 5. The wires 1 and threads 2 form approximately the same angle with the line 5, in the case shown an angle of about 45°. Other angular positions usual in tyre constructions can be employed, however, for example angular positions of 40 to 60° to the mid-circumferential line.

Fig. 4 shows two layers of textile threads 2 arranged both below and above the layer of steel wires 1, so that the stresses within the tyres are approximately equally absorbed by both tyres of reinforcing insertion.

With less strongly stressed tyres, the tensions within the tyre can be distributed equally between the layers and, as shown in Figs. 5 and 6, further textile threads 2 are arranged between the less extensible steel wires 1 and lying in one plane with these. This arrangement is suitable for tyres in which small steel wires 1 are provided, so that the further textile threads 2 can be inserted between such steel wires 1 which are arranged a relatively wide distance apart.

It will be understood that the insertions represented in the above embodiments, as regards the number of reinforcing layers in use, are given only as examples. It is within the scope of the invention to provide, instead of one layer of steel wires 1 with the textile threads 2 on either side, a number of less extensible reinforcing supports, e.g. the steel wires 1, with a corresponding increase in the insertions consisting of textile threads 2. Furthermore, the central arrangement of insertions formed from the steel wires 1 with the more extensible insertions on either side is not absolutely essential. The layer or layers formed of the less extensible reinforcing insertions may be formed as the outer as well as the inner layer.

One suitable proposal is that beneath the tread surface of the tyre, in addition to the carcass insertions, a breaker strip comprising an insert corresponding approximately to the width of this tread surface and comprising cords of a material of small extensibility is arranged. The cords of this breaker strip may lie parallel or substantially parallel to the direction of the cords of the more extensible

carcase insertion or insertions which is other than that of the less extensible insertions and it is also possible to make this breaker strip insert in the form of a web embedded beneath the tread surface of the tyre.

What we claim is:—

1. A pneumatic vehicle tyre having reinforcing insertions of different extensibilities which are anchored to the bead portions of the tyre by means of bead rings, wherein reinforcing insertions with the smaller extensibility are incorporated in the tyre only in one direction inclined obliquely to the mid-circumferential line of the tyre and reinforcing insertions of greater extensibility are incorporated in the tyre in another direction inclined obliquely to the mid-circumferential line of the tyre and crossing the first-mentioned reinforcing insertions.

2. A pneumatic tyre according to claim 1 wherein a layer of reinforcing insertions of smaller extensibility and two or more layers of reinforcing insertions of greater extensibility crossing the former are provided.

3. A pneumatic tyre according to claim 2 wherein a layer of obliquely reinforcing insertions of smaller extensibility is located between several layers of reinforcing insertions of greater extensibility.

4. A pneumatic tyre according to claim 1, 2 or 3 wherein further insertions of greater extensibility are arranged between the less extensible insertions and in the same plane.

5. A pneumatic tyre according to claim 1, 2, 3 or 4 wherein a breaker strip comprising an additional insert approximately corresponding in width to the tread of the tyre is located beneath the tread surface so as to lie parallel to said other direction of the more extensible insertions.

6. A pneumatic tyre according to any of the preceding claims wherein the reinforcing insertions of smaller extensibility consist of steel wires, especially twisted steel wires, and the reinforcing insertions of greater extensibility consist of textile threads.

7. A pneumatic tyre as claimed in claim 1 substantially as hereinbefore described with reference to the accompanying drawings.

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Agents for the Applicants.

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Fig.1

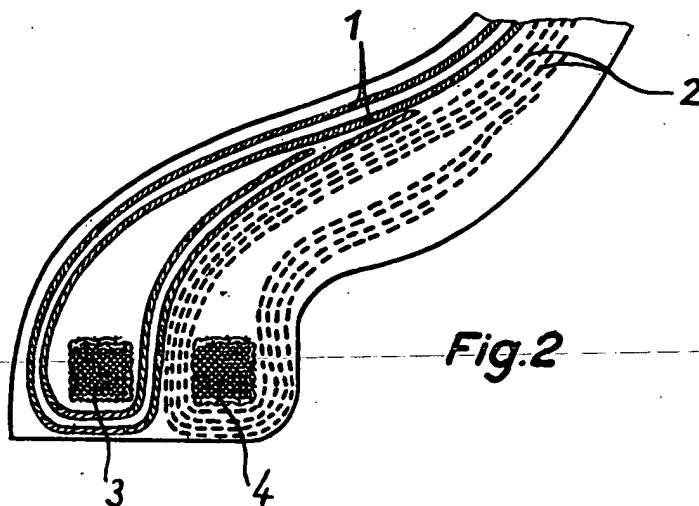
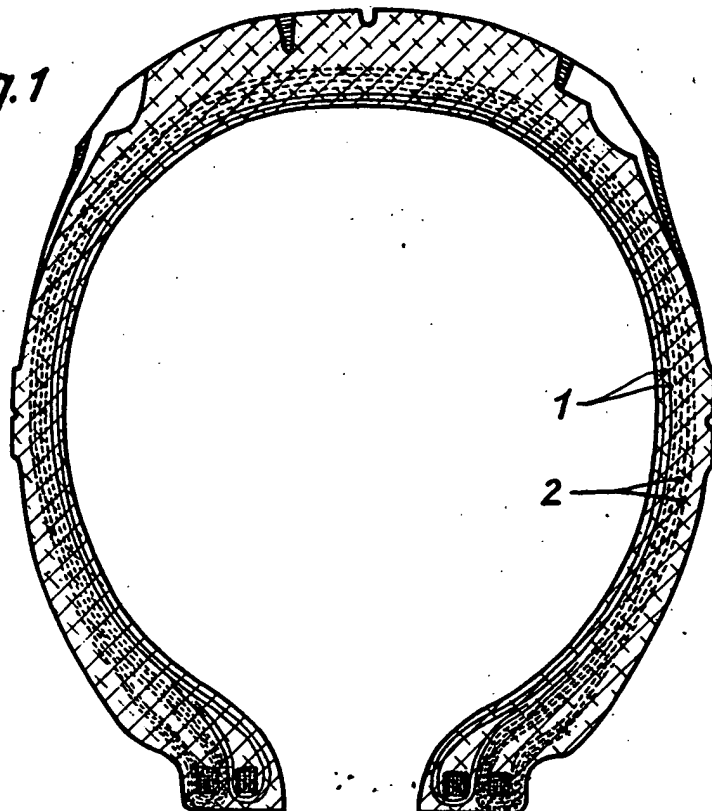


Fig.2

This drawing is a reproduction of
the Original on a reduced scale.

SHEETS 1 & 2

Fig. 3

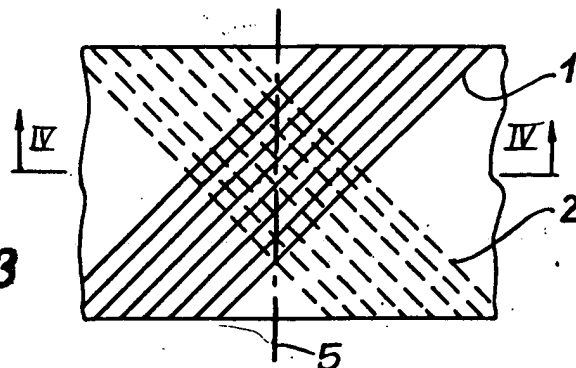


Fig. 4



Fig. 5

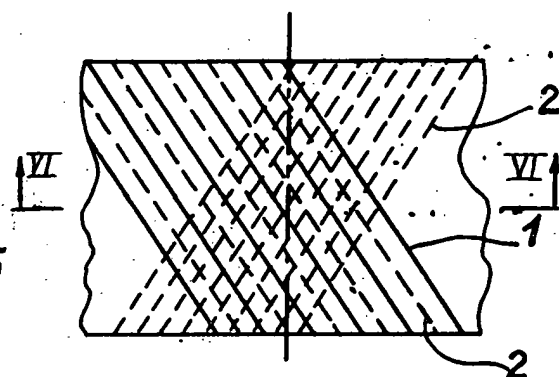
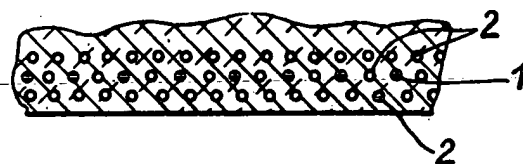


Fig. 6



Steel & Fabric